Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Best evidence statement (BESt). Continuous positive airway pressure (CPAP) versus high flow nasal cannula (HFNC) in neonatal respiratory distress.

Bibliographic Source(s)

Cincinnati Children's Hospital Medical Center. Best evidence statement (BESt). Continuous positive airway pressure (CPAP) versus high flow nasal cannula (HFNC) in neonatal respiratory distress. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2011 Oct 4. 5 p. [9 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

There is insufficient evidence and lack of consensus to recommend the use of continuous positive airway pressure (CPAP) rather than high flow nasal cannula (HFNC) to decrease the work of breathing or oxygen use.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Respiratory distress in neonates

Guideline Category

Assessment of Therapeutic Effectiveness

Treatment

Clinical Specialty

Critical Care

Pediatrics

Pulmonary Medicine

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To evaluate, among neonates experiencing respiratory distress, if continuous positive airway pressure compared to high flow nasal cannula decreases the work of breathing and the use of oxygen

Target Population

Neonates 1500 grams and less

Inclusion: Neonates recognized as having difficulty breathing including increased respiratory effort and oxygen requirement

Exclusion: Neonates in respiratory or cardiac arrest, or with agonal respirations, pneumothorax, or inability to maintain airway patency

Interventions and Practices Considered

1. Continuous positive airway pressure (CPAP)
2. High flow nasal cannula (HFNC)

Major Outcomes Considered

- Change in work of breathing (as measured by visual inspection of the patients breathing effort)
- Incidence of atelectasis/collapse on chest x-ray
- Change in oxygen percentage
- Requirement for reintubation
- Cardiopulmonary stability

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Databases Searched: Medline, CINAHL, and Google Scholar

Search Terms: CPAP/continuous positive airway pressure, high flow nasal cannula, work of breathing, humidified high flow nasal cannula, neonates less than 1500 grams

Filters: English language

Retrieved: February 1, 2011-August 30, 2011

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Table of Evidence Levels

Quality Level	Definition
1a† or 1b†	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain
5a or 5b	General review, expert opinion, case report, consensus report, or guideline
5	Local consensus

†a = good quality study; b = lesser quality study

Note: See the original guideline document for further information about the dimensions used to judge the strength of the evidence.

Methods Used to Analyze the Evidence

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Table of Recommendation Strength

Strength	Definition
It is strongly recommended that… It is strongly recommended that… not…	There is consensus that benefits clearly outweigh risks and burdens (or vice versa for negative recommendations).
It is recommended that… It is recommended that… not…	There is consensus that benefits are closely balanced with risks and burdens.
There is insufficient evidence and a lack of consensus to make a recommendation…	
Dimensions: In determining the strength of a recommendation, the development group makes a considered judgment in a consensus process that incorporates critically appraised evidence, clinical experience, and other dimensions as listed below.	
1. Grade of the body of evidence 2. Safety/harm 3. Health benefit to the patients (direct benefit) 4. Burden to patient of adherence to recommendation (cost, hassle, discomfort, pain, motivation, ability to adhere, time) 5. Cost-effectiveness to healthcare system (balance of cost/savings of resources, staff time, and supplies based on published studies or onsite analysis) 6. Directness (the extent to which the body of evidence directly answers the clinical question [population/problem, intervention, comparison, outcome]) 7. Impact on morbidity/mortality or quality of life	

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Peer Review

Description of Method of Guideline Validation

This Best Evidence Statement has been reviewed against quality criteria by 2 independent reviewers from the Cincinnati Children's Hospital Medical Center (CCHMC) Evidence Collaboration.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Adequate oxygenation of neonates experiencing respiratory distress

Potential Harms

Side effects of continuous positive airway pressure (CPAP) are discomfort from the prongs and mask because they can be irritating to the nose and can increase nasal secretions that can lead to an increased risk of nasal infection. The portion of the nose between the nostrils (columella) must be carefully monitored for pressure indentations to prevent breakdown as well. Some infants may become agitated to the point that sedation is required to maintain the prongs in the nose. The head gear/bonnet that is used to secure tubing that secures the nasal prongs or mask is also an area of concern that must be closely monitored for the presence of skin break down. Gastric distension and feeding intolerance are also possible side effects.

Qualifying Statements

Qualifying Statements

This Best Evidence Statement addresses only key points of care for the target population; it is not intended to be a comprehensive practice guideline. These recommendations result from review of literature and practices current at the time of their formulation. This Best Evidence Statement does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this Statement is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Audit Criteria/Indicators

Patient Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Cincinnati Children's Hospital Medical Center. Best evidence statement (BESt). Continuous positive airway pressure (CPAP) versus high flow nasal cannula (HFNC) in neonatal respiratory distress. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2011 Oct 4. 5 p. [9 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2011 Oct 4

Guideline Developer(s)

Cincinnati Children's Hospital Medical Center - Hospital/Medical Center

Source(s) of Funding

Cincinnati Children's Hospital Medical Center

Guideline Committee

Not stated

Composition of Group That Authored the Guideline

Team Leader: Tonie Perez, BHS, RRT III-NPS, NICU

Other group/team members: Rhonda Schum, RRT II, The Heart Center; Tanya Scholl, BHS, RRT III-NPS, Pediatric Intensive Care Unit

Ad Hoc Reviewers: Scott Pettinichi, Med, RRT-NPS, Sr. Clinical Director, Division of Respiratory Care

Support personnel: Barbara K. Giambra, MS, RN, CPNP, Evidence-Based Practice Mentor, Center for Professional Excellence/Research and Evidence-Based Practice

Financial Disclosures/Conflicts of Interest

Conflicts of interest were declared for each team member and no financial conflicts of interest were found.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the Cincinnati Children's Hospital Medical Center Web site .

Print copies: For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Cincinnati Children's Hospital Medical Center Health James M. Anderson Center for Health Systems Excellence at EBDMInfo@cchmc.org.

Availability of Companion Documents

The following are available:

- Judging the strength of a recommendation. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2008 Jan. 1 p. Available from the Cincinnati Children's Hospital Medical Center Web site .
- Grading a body of evidence to answer a clinical question. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 1 p. Available from the Cincinnati Children's Hospital Medical Center Web site .
- Table of evidence levels. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2008 Feb 29. 1 p. Available from the Cincinnati Children's Hospital Medical Center Web site .

Print copies: For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Cincinnati Children's Hospital Medical Center Health James M. Anderson Center for Health Systems Excellence at EBDMInfo@cchmc.org.

In addition, suggested outcome or process measures are available in the original guideline document .

Patient Resources

A variety of patient education materials about continuous positive airway pressure are available from the Cincinnati Children's Hospital Medical Center Web site .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI Institute on March 28, 2012.

Copyright Statement

Copies of Cincinnati Children's Hospital Medical Center (CCHMC) Best Evidence Statement (BESt) are available online and may be distributed by any organization for the global purpose of improving child health outcomes. Examples of approved uses of the BESt include the following:

- Copies may be provided to anyone involved in the organization's process for developing and implementing evidence based care
- Hyperlinks to the CCHMC website may be placed on the organization's website
- The BESt may be adopted or adapted for use within the organization, provided that CCHMC receives appropriate attribution on all written or electronic documents
- Copies may be provided to patients and the clinicians who manage their care

Notification of CCHMC at EBDMInfo@cchmc.org for any BESt adopted, adapted, implemented or hyperlinked by the organization is appreciated.

Disclaimer

NGC Disclaimer

The National Guideline Clearinghouseâ„¢ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at http://www.guideline.gov/about/inclusion-criteria.aspx.

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.